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(57) Abstract

A substantially anhydrous underarm cream composition suitable for topical application to the human skin, comprising an antiperspirant and/or deodorant agent, 0.5 % to 3 % by weight of a clay suspending or thickening agent, 5.0 % to 25 % by weight of a non-volatile masking agent, 3 to 20 % by weight of a structuring wax having a melting point of at least 45 °C, and 20 to 90 % volatile carrier fluid, obtainable by shearing together at least the antiperspirant and/or deodorant agent, the clay, the masking agent, the carrier fluid and the wax above the melting point of said wax.

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UNDERARM COMPOSITIONS

The invention relates to novel cream underarm compositions which contain a structuring wax material. More particularly, the invention concerns antiperspirant and deodorant compositions for topical application to the human skin, containing structuring wax, a clay material and a masking oil.

It is known for underarm compositions for topical application to contain non-volatile silicone fluids such as polyorganosiloxanes which impart emolliency to the composition and can provide a masking effect to conceal solids present in the composition. Examples of such solids include antiperspirant actives. The efficacy of the composition is not seriously affected by the presence of the non-volatile silicone. An example of such compositions is to be found in EP 28853 (The Procter & Gamble Company).

It is also known to include certain categories of alkyl siloxane waxes in underarm compositions. EP 549223 (Dow Corning) describes stick, roll on and spray underarm compositions containing certain long chain alkyl silicone waxes. The waxes are alleged to provide the formulations with desirable characteristics such as improved hardness, reduced whitening, improved skin feel and compatibility with other ingredients.

Our co-pending British Patent Application Number 9506039.8 describes the use of alkyl ester siloxane waxes to improve the sensory properties such as skin feel of underarm compositions.

The abovementioned formulations of the prior art describe suspension compositions which are generally preferred to the

already known emulsion compositions which have been found to produce undesirable sensations on the skin such as a sticky or wet feeling. The suspending agent facilitates the efficient suspension of powder materials such as antiperspirant actives in the composition to enhance efficacy and stability of the composition on storage.

However, many suspending agents of the prior art, whilst improving skin feel in some respects (e.g. reducing the wet sensation) impart other undesirable sensations to the skin such as grittiness and can also result in visible deposits on the skin and fabrics.

In an attempt to overcome this problem EP135315 (The Mennen Company) describes a clay free antiperspirant product containing a volatile silicone and a gelling agent. However, the omission of the clay suspending agent can result in a product which is still unstable at high temperatures and over prolonged periods and which has a lowered viscosity which can be undesirable in cream formulations.

An object of the invention is to overcome the disadvantages of the formulations of the prior art.

According to the invention there is provided a substantially anhydrous underarm cream composition suitable for topical application to the human skin, comprising an antiperspirant and/or deodorant agent, 0.5% to 3% by weight of a clay suspending or thickening agent, 5.0% to 25% by weight of a non-volatile masking agent, 3 to 20% by weight of a structuring wax having a melting point of at least 45°C, and 20 to 90% volatile carrier fluid, obtainable by shearing together at least the antiperspirant and/or deodorant agent, the clay, the masking agent, the carrier fluid and the wax above the melting point of said wax.

Preferably, the underarm cream composition comprises 1% to 2% by weight of clay. Suitably, the clay is selected from the group comprising bentonites, smectites, saponites, reacted variants thereof and mixtures thereof.

Preferably, the underarm composition comprises 5% to 15% by weight structuring wax and the structuring wax is selected from the group comprising alkyl methyl siloxane waxes, alkyl ester siloxane waxes, insect and animal waxes, fatty acids, fatty alcohols, fatty acid esters and fatty acid amides and mixtures thereof.

Preferably, the alkyl methyl siloxane wax is a wax having a general formula I:

$$R-(SiMe_2-O-)_xSiMe_2R$$ wherein

R is a C16-C40 alkyl group, X is 10 to 50, and Me is a CH_3 group and the average terminal alkyl chain length is at least C30.

Preferably R is a C25-C40 alkyl group.

Alternatively, the alkyl ester siloxane wax is a wax of general formula II:

$$(Me_3Si)O(SiMe_2O)_aSi(Me)(CH_2)_b-O-COR(SiMe_3)$$

wherein a is an integer from 0 to 2;
b is an integer from 2 to 4;
Me is CH_3;
R is a straight or branched chain alkyl from $C_{10}H_{21}$ to $C_{30}H_{61}$.

Suitably, R is $C_{19}H_{39}$, a is 1 and b is 3.

Preferably, the non-volatile masking oil is selected from the group comprising non-volatile silicones and polyolefins or mixtures thereof. More preferably, the polyolefin is polydecene.

Suitably, the volatile carrier fluid is a volatile silicone. Advantageously, the antiperspirant agent is an inorganic and/or organic source of aluminum and zirconium or a mixture thereof.

In an alternative embodiment the invention provides a substantially anhydrous cream antiperspirant composition comprising 5 to 30% by weight antiperspirant agent, 0.5% to 3% by weight of a clay suspending or thickening agent, 5% to 25% by weight of a non-volatile masking agent, 3% to 20% by weight of a structuring wax having a melting point of at least 45°C and 20 to 86.5% volatile carrier fluid, obtainable by shearing together at least the antiperspirant, the masking agent, the carrier fluid and the clay and the wax at a temperature equal to or above the melting point of said wax.

Generally, creams are defined in terms of cone penetration values. A typical cream can be described as having a cone penetration value of between approximately 10mm and 30mm where the cone has a diameter of 16.5mm and a weight of 102.5g.

Surprisingly, it has now been found that by combining a structuring wax having specified melting point characteristics with a clay suspending agent and a non-volatile masking agent and subjecting the mixture to shear above the melting point an underarm composition which is stable for long periods and at high temperatures is obtained. However, the composition does not exhibit any of the undesirable characteristics such as poor skin feel and

deposition previously associated with clay containing underarm compositions.

Suitable clays are hectorires and montmorillionites including bentonites, smectites, saponites and reacted variants thereof. A preferred bentonite is Bentone 38 available from NL Industries. A single clay or a blend of clays can be used.

Typically used antiperspirant salts include inorganic and organic salts of aluminium and zirconium and mixtures thereof. Particularly preferred are the aluminium/zirconium salts of aluminium halides, aluminium hydroxyhalides, aluminium zirconium salts and mixtures thereof. Particularly preferred antiperspirant salts include activated aluminium chlorohydrate compounds as described in EP6739 (Unilever NV et al). Further antiperspirant actives are described in EP 28853. The contents of both these applications are incorporated herein by reference.

Any effective deodorant composition known in the art is suitable for incorporation into the composition e.g. sodium bicarbonate, zinc ricinoleate, other inorganic salts, short chain monohydric alcohols, polyhydric alcohols or compounds such as triclosan. The deodorants can be utilised alone or in conjunction with the antiperspirant active component where compatible.

The carrier fluid suitably comprises a volatile silicone material. Examples of such materials are cyclic or linear polydimethylsiloxanes. Preferred cyclic polydimethylsiloxanes have from 3 - 7 silicone atoms and a viscosity less than 10 mm^2s^{-1} (cSt) at 25°C. Preferred linear polydimethylsiloxanes have from 3 - 9 silicone atoms and a viscosity of less than 5 mm^2s^{-1} at 25°C. Preferred

polydimethylsiloxanes are available from Dow Corning Corporation as Dow Corning 344 and 345. Preferably, if used in the composition, the volatile silicone is present at a level of 30 to 60% by weight, more preferably 40 to 60% by weight.

The non-volatile masking agent is also present in the formulation and preferably comprises a hydrocarbon polymer such as poly olefins.

The poly olefins are suitably hydrocarbon polymers, with the preferred ones being liquid at room temperature (i.e. 21°C). It is also highly preferred that the poly olefin in the composition has a relatively low viscosity. Preferably, the viscosity of the poly olefin hydrocarbon masking agent is less than about 40 cSt at 40°C, more preferably less than about 30 cSt at 40°C.

Preferably, the poly olefin comprises a poly alpha olefin. Preferred poly alpha olefins for use in compositions according to the invention are polydecenes, for example the Silkflo range of polydecenes, manufactured by Albermarle Corporation. Other preferred poly olefins for use in compositions according to the invention include polybutene, which is commercially available under the trade name Panalene L14E from Amoco, and polyisobutene, which can be obtained from Prespere under the trade name Permethyl.

As such, preferred poly olefins for use in compositions according to the invention may have monomer chain lengths in the region of 3-15 carbon atoms. Preferred poly olefin blends which are commercially available may conveniently contain a blend of various polymers, including dimers, trimers, and so on. Preferred materials for use in compositions according to the invention include Silkflo

362NF, Silkflo 364NF, and Silkflo 366NF, available from Albermarle Corporation.

When used in compositions according to the invention, the poly olefin hydrocarbons described help to confer to the composition surprisingly good sensory properties, including a surprising lack of greasiness after application, and where the composition is an antiperspirant composition, provide an enhanced degree of masking of any whiteness that may be left by the antiperspirant salt in the composition.

An advantage of using the poly olefin hydrocarbons is that they have been found not to interfere with the efficacy of any antiperspirant active salt in the composition to any major degree.

The non-volatile masking oil which can function as an emollient can also be a non-volatile silicone. The non-volatile silicone may be a polyalkyl siloxane, a polyalkaryl siloxane or a polyether siloxane copolymer. Preferred polyalkysiloxanes have viscosities ranging from 10 to 100,000 mm^2s^{-1} (cSt) at 25°C. Such siloxanes are available from the Dow Corning Corporation as the Dow Corning 200 series.

Suitable polyalkaryl siloxanes are the polymethylphenylsiloxanes having viscosities of 15 to 65mm^2s^{-1} (cSt) at 25°C. These siloxanes are available as the Dow Corning 556 fluid.

A suitable polyether siloxane is dimethyl polyoxyalkylene ether copolymer having a approximate viscosity of 1200 to 1500 mm^2s^{-1} (cSt) at 25°C e.g. a polysiloxane ethylene glycol ether copolymer.

Preferred structuring waxes are the alkyl methylsiloxanes.

• Suitable alkyl methylsiloxanes include those having the general formula (I):

$$R - (SiMe_2-O-)_x SiMe_2R$$

where R = C16 to C40
X = 10-50
Me = CH_3

The structuring waxes have been found to exhibit a significant masking effect on the formulations to conceal deposition of actives and suspending agents. The alkylmethylsiloxane wax preferably has a melting point of greater than 45°C.

Preferably, the alkylmethylsiloxane wax is made up of C16 to C40 alkyl groups, more preferably C25 to C35.

Generally, such waxes will be made up of a blend of alkyl group chain lengths with the characteristics of the wax and hence its structuring effect being determined by the blend of chain lengths utilised.

The waxes selected having terminal long alkyl chains are particularly effective at structuring the composition. Pendant C30 and upwards species and C16 to C18 terminal alkyl waxes sometimes result in excessively soft solids which may fail to keep a stable structure following heat storage which results in an excessively thin composition. Similar difficulties are experienced when the average terminal alkyl chain length is below C30.

A preferred alkylmethylsiloxane wax is known as GE wax SF1642 available from the General Electric Company in which the main alkyl species are C30, C32 and C34 with minor amounts of C26 and C28.

The structuring wax can also be an alkyl ester siloxane wax of general formula (II):

$(Me_3Si)O(SiMe_2O)_aSi(Me)(CH_2)_b$-O-COR$(SiMe_3)$

where a is an integer from 0 to 2
b is an integer from 2 to 4
Me is CH_3
R is a straight or branched chain alkyl from $C_{10}H_{21}$ to $C_{30}H_{61}$

Suitably, R is a straight chain alkyl $C_{19}H_{39}$. In addition, a is suitably 1 and b is suitably 3.

The wax used in compositions according to the invention is an alkyl ester silicone wax. The inclusion of this wax in the formulation may impart some emolliency to the composition. Accordingly, it is possible to do without, or reduce, the amount of emollient materials, such as volatile or non-volatile silicones, which are conventionally included in such compositions.

A particularly preferred alkyl ester silicone wax for use in compositions according to the invention is a behenic acid silicone wax, which in general structure (II) has a value for a of 1 and for b of 3, and in addition has R as $C_{19}H_{39}$. Such a wax is available from Rhone Poulenc under the tradename Mirasil-B 71649 wax.

Other structurant waxy materials which may also be employed in accordance with the present invention include high and low melting point waxes, gums, resins, polymers, starches and elastomers. High melting point waxes include insect and animal waxes such as beeswax and spermaceti; vegetable waxes such as carnauba, candelilla, Ouricury, Japan wax,

Douglas-fir bark wax, rice-bran wax, castor wax and bayberry wax; mineral waxes such as montan wax, peat wax, ozokerite and ceresin; petroleum waxes such as paraffin wax; synthetic waxes such as Fischer-Tropsch waxes, polyethylene waxes, chemically modified hydrocarbon waxes and substituted amide waxes. Examples of low melting point waxes include fatty acids, fatty alcohols, fatty acid esters and fatty acid amides having carbon chains of 3 to 30 carbon atoms. Particularly preferred low melting point waxes include stearyl alcohol, cetyl alcohol, myristyl alcohol and palmitic acid.

The wax structurant can be a single wax or blend of the aforementioned waxes selected to provide the desired melting point and skin feel characteristics. For instance, a combination of 6% SF1642 and 5% Castorwax MP80 is particularly effective and results in a wax structurant which shears at approximately 45°C.

EXAMPLES

Example 1

An anhydrous antiperspirant cream was produced having the following formulation:

Ingredient	Function	% wt
AZAG (Powder)	Antiperspirant	24.0
Castorwax MP80	Structurant	5.0
GE SF1642 (1229-425)	Silicone Wax & Deposit Masker	6.0
Bentone	Structurant	1.0
Volatile Silicone	Carrier Fluid	45.0
Non-Volatile Hydrocarbon (Albemarle Silkflo 364NF)	Deposit Masker	10.0
Talc (Suprafino)	Aid Dry Skin-Feel	8.0
Fragrance		1.0

The cream was made by using the following four stages:

Stage 1: 10.0% Silkflo 364NF, 45.0% Volatile Silicon DC345

Add Silkflo to Volatile Silicone, start stirrer to half speed and heat to 66°C.

Stage 2: 1.0% Bentone 38, 8.0% Suprafino Talc, 24.0% AZAG Powder

Draw in powders and mix for 5 minutes. After addition is complete, reheat to 66°C.

Stage 3: 5.0% Castorwax MP80, 6.0% GE Wax SF1642

Premelt waxes at 80°C and then add to main vessel with stirring at full speed.

Stage 4: 1.0% Fragrance

Add perfume and shear for 5 minutes at 68-70°C.

Comparative Example:

The above cream in Example 1 was manufactured with the omission of Bentone. The Bentone was replaced by 1% volatile silicone carrier fluid and manufactured in the same way.

Comparative Data (Sensory):

20 panellists applied 0.1g of a cream to the backs of their hands, rubbed for 5 seconds and then made tactile assessments of dryness and greasiness. 14/20 selected the Bentone-containing cream as the drier (significant difference at >94% confidence) over the non-Bentone control cream.

For greasiness, 13/20 selected the Bentone-containing cream as less greasy than the non-Bentone control (significant difference at >86% confidence).

The above results with regard to greasiness and dryness are summarised in Table I.

Comparative Data (Processing):

In terms of processing benefit, the Bentone containing composition was more viscous than the non-Bentone equivalent. For instance, the Bentone containing composition when processed at 68°C, sheared for 10 minutes and then filled at

55 deg°C a composition having a viscosity ranging from 235,000 to 240,000 cps was obtained.

The identical non-Bentone composition had a viscosity of 220,000 cps.

Moreover, when the product was processed and filled at 68°C, and mixed as above for 10 minutes, then the Bentone composition had a viscosity of 472,000 cps whereas the Bentone free composition had a viscosity of 360,000 cps.

Example 2

An anhydrous antiperspirant cream having the following composition was prepared as described in Example 1:

Ingredient	%wt
AZAG (powder)	24.0
Castorwax MP80	5.0
GE SF1642	6.0
Bentone	1.0
Volatile Silicone	43.0
Silkflo 364NF	14.0
Talc	6.0
Fragrance	1.0

Rheology

The rheology of the formulation of example 2 was examined to demonstrate the stability characteristics of the composition when processed at various temperatures.

A Carri-Med Controlled Stress Rheometer CSL100 instrument was used. A vane/cup measuring system was employed with a mesh interior fitted to the cup to ensure prevention of wall slip.

Experiments were carried out at 25°C unless otherwise stated. Equilibrium flow experiments were conducted on fresh samples to obtain the exact flow properties of the sample. The sample was allowed to equilibrate at a fixed temperature (25°C) for one hour before measuring to ensure no temperature gradient.

The data produced resulted in an equilibrium viscosity figure (Pa.s) which occurs under low shear stress and the point at which the sample catastrophically fails. The lower the equilibrium viscosity figure the more unstable the sample.

Results

Figure 1 shows the rheological properties of the composition of Example 2 when processed at 29°C, 45°C and 60°C. As shown in the Figure low temperatures did not result in a stable structured product. Low equilibrium viscosity figures are usually an indication that the product will show leakage of carrier fluid.

As shown in the Figure the composition of Example 2 when processed at 29°C resulted in an unstable composition while the samples processed at 45°C and 60°C were significantly more stable and hence less disposed towards carrier leakage.

The following examples describe compositions produced according to the method described for Example 1 in which a variety of waxes, clays, and emollients are used.

Example 3

Ingredient	% wt
Aluminium Zirconium Tetrachlorohydrex Glycine Complex	25.0
Bentone 38[1]	2.0
Trihydroxy stearin	6.0
Isopropyl palmitate	11.0
Cyclomethicone DC345	60.0
Polyethylene	6.0

[1]Smectite clay mineral lattice containing organic cations, from Steetley/NL Industries

Example 4

Ingredient	% wt
Aluminium Zirconium Octachlorohydrex Glycine Complex	22.00
Perchem 462 montmorillonite clay (from Percham)	1.25
Cyclomethicone DC245	40.10
Behenyl beeswaxate (from Koster Keunen)	6.00
Mirasil B (from Rhone Poulenc)	2.00
Polyethylene	6.65
Panalane L-14E polybutene (Amoco)	22.00

Example 5

Ingredient	% wt
Aluminium Zirconium Pentachlorohydrex Glycine Complex	25.0
Bentone Gel IPM[2]	3.0
Cerit SH hydrogenated castor oil (Ceralit)	4.5
Finsolv TN (C12-15 Alcohols Benzoate from Finetex)	18.0
Volatile Silicone DC244	44.5
Talc	5.0

[2] organically modified smectite clay gelled in isopropyl myristate, from Steetley/NL Industries

Example 6

Ingredient	% wt
Aluminium Zirconium Trichlorohydrex Glycine Complex	18.0
Bentone Gel SIL[3]	3.0
Dimethicone DC200 Fluid 350cs	25.0
Candelilla Wax	7.0
C24/C28 Alkyl Dimethicone Wax	3.5
Volatile Silicone DC344	43.5

[3] organically modified smectite clay gelled in silicone, from Steetley/NL industries

Example 7

Ingredient	% wt
Aluminium Zirconium Tetrachlorohydrex Glycine Complex	15.0
Ozokerite Wax	8.0
Isopropyl myristate	20.0
Cyclomethicone DC345	50.0
Veegum D[4]	1.0
Talc	6.0

[4] refined smectite clay from R T Vanderbilt

Example 8

Ingredient	% wt
Aluminium Zirconium Pentachlorohydrex Glycine Complex	26.0
Bentone EW[5]	2.5
Thixcin R[6]	4.5
Cyclomethicone	52.5
Dimethicone DC200 Fluid 100cs	5.0
C30+ Alkyl dimethicone	6.5
Polyethylene	3.0

[5] powdered smectite clay from Steetley

[6] hydrogenated castor oil from Rheox

Example 9

Ingredient	% wt
Aluminium Chlorohydrate ultrafine powder	25.0
Hectabrite AW montmorillonite (from American Colloid)	0.8
Stearyl alcohol	7.0
Cetyl alcohol	3.0
C30 + Alkyl dimethicone	1.5
Cyclomethicone	58.9
Dry Flo	3.0
Fragrance	0.8

Example 10

Ingredient	% wt
Aluminium Zirconium Trichlorohydrex Glycine Complex	25.0
Bentone 38 (Steetley/NL Industries)	1.0
Castorwax MP80[7]	6.5
Waxenol 822[8]	1.0
Diisopropyl dilinoleate (Pripure 3786 DIPD)	7.0
Cylcomethicone	59.5

[7] hydrogenated castor oil

[8] Eicosanol behenate from Caschem

CLAIMS

1. A substantially anhydrous underarm cream composition suitable for topical application to the human skin, comprising an antiperspirant and/or deodorant agent, 0.5% to 3% by weight of a clay suspending or thickening agent, 5.0% to 25% by weight of a non-volatile masking agent, 3 to 20% by weight of a structuring wax having a melting point of at least 45°C, and 20 to 90% volatile carrier fluid, obtainable by shearing together at least the antiperspirant and/or deodorant agent, the clay, the masking agent, the carrier fluid and the wax above the melting point of said wax.

2. An underarm composition as claimed in claim 2 characterised in that it comprises 1% to 2% by weight of clay.

3. An underarm composition as claimed in claim 1 or claim 2 characterised in that the clay is selected from the group comprising bentonites, smectites, saponites, reacted variants thereof and mixtures thereof.

4. An underarm composition as claimed in any of claims 1 to 3 characterised in that it comprises 5% to 15% by weight structuring wax.

5. An underarm composition as claimed in any of claims 1 to 4 characterised in that the structuring wax is selected from the group comprising alkylmethylsiloxane waxes, alkyl ester siloxane waxes, insect and animal waxes, fatty acids, fatty alcohols, fatty acid esters and fatty acid amides and mixtures thereof.

6. An underarm composition as claimed in claim 5 characterised in that the alkylmethylsiloxane wax is a wax having the general formula I:

$R-(SiMe_2-O-)_xSiMe_2R$ wherein

R is a C16-C40 alkyl group, X is 10 to 50, and Me is a CH_3 group and the average terminal alkyl chain length is at least C30.

7. An underarm composition as claimed in claim 6 characterised in that R is a C25 to C40 alkyl group.

8. An underarm composition as claimed in claim 5 characterised in that the alkyl ester siloxane wax is a wax of general formula II:

$(Me_3Si)O(SiMe_2O)_aSi(Me)(CH_2)_b-O-COR(SiMe_3)$

wherein a is an integer from 0 to 2;
b is an integer from 2 to 4;
Me is CH_3;
R is a straight or branched chain alkyl from $C_{10}H_{21}$ to $C_{30}H_{61}$.

9. An underarm composition as claimed in claim 8 characterised in that R is $C_{19}H_{39}$, a is 1 and b is 3.

10. An underarm composition as claimed in any of claims 1 to 9 characterised in that the non-volatile masking oil is selected from the group comprising non-volatile silicones and polyolefins or mixtures thereof.

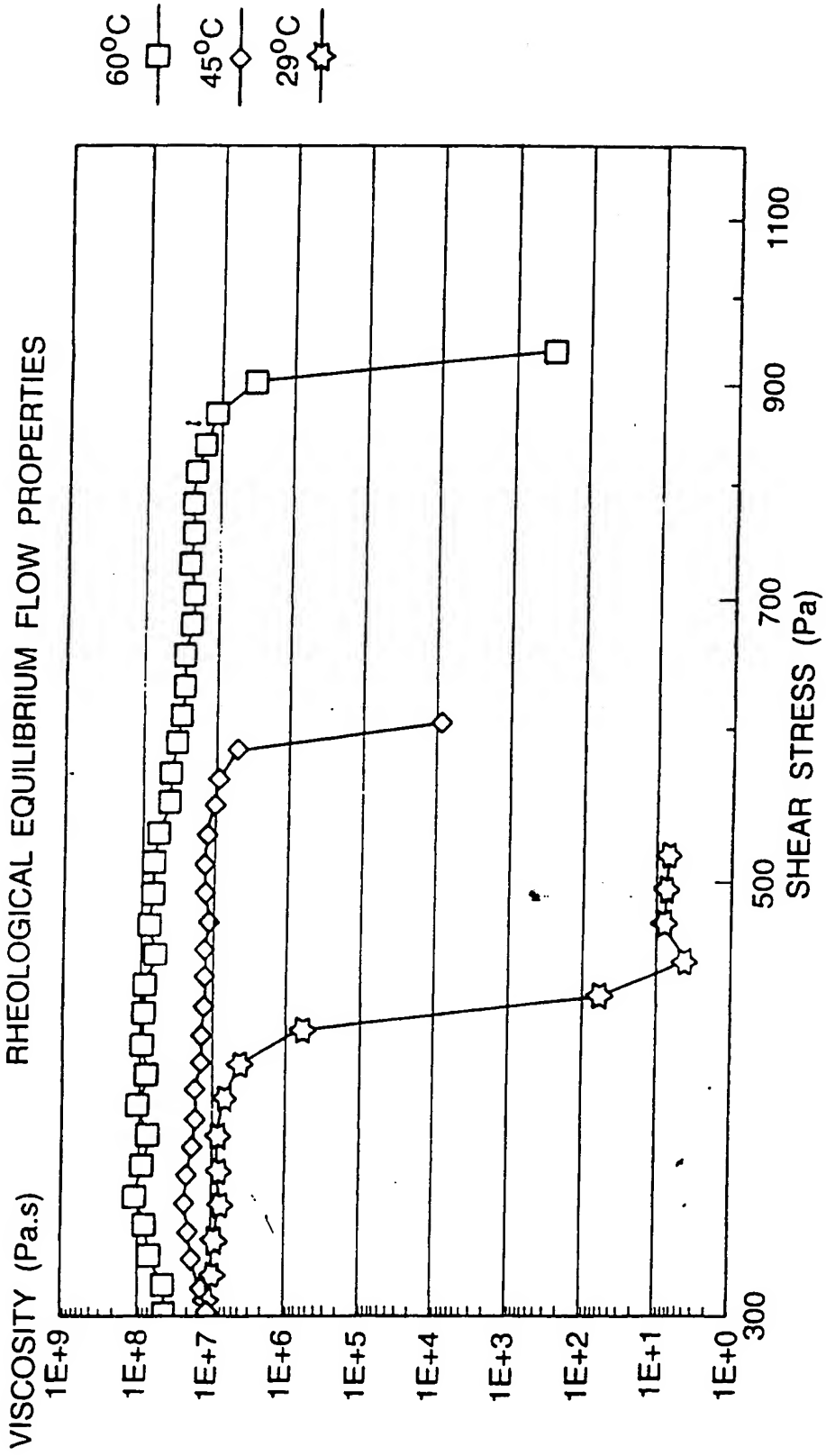
11. An underarm composition as claimed in claim 10 characterised in that the polyolefin is polydecene.

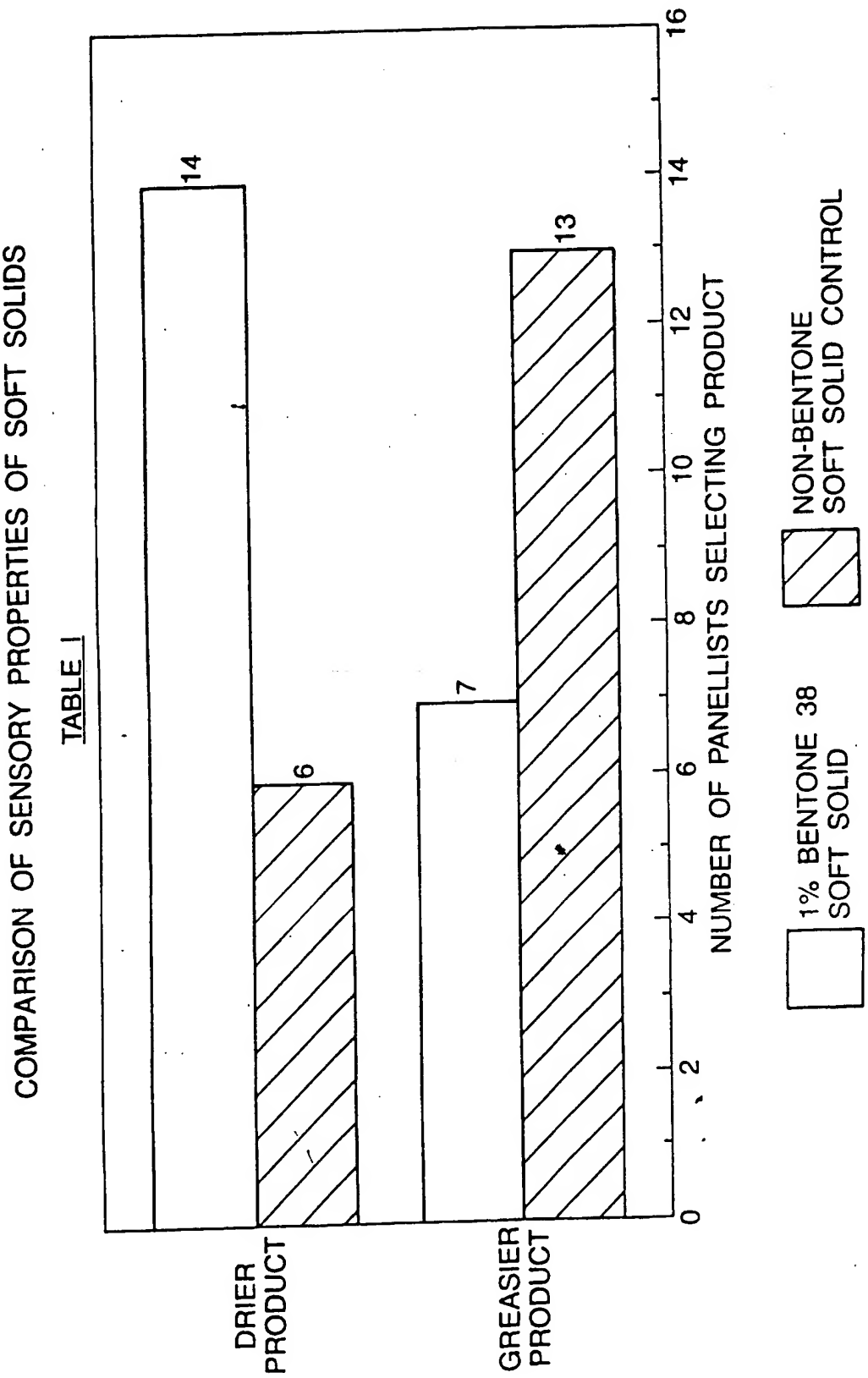
12. An underarm composition as claimed in any of claims 1 to 11 characterised in that the volatile carrier fluid is a volatile silicone.

13. An underarm composition as claimed in any of claims 1 to 12 characterised in that the antiperspirant agent is an inorganic and/or organic salt of aluminium and zirconium or a mixture thereof.

14. A substantially anhydrous cream antiperspirant composition comprising 5 to 30% by weight antiperspirant agent, 0.5% to 3% by weight of a clay suspending or thickening agent, 5% to 25% by weight of a non-volatile masking agent, 3% to 20% by weight of a structuring wax having a melting point of at least 45°C and 20 to 86.5% volatile carrier fluid, obtainable by shearing together at least the antiperspirant, the masking agent, the carrier fluid and the clay and the wax at a temperature equal to or above the melting point of said wax.

Fig.1.


RHEOLOGICAL EQUILIBRIUM FLOW PROPERTIES
60°C
45°C
29°C
VISCOSITY (Pa.s)
1E+9
1E+8
1E+7
1E+6
1E+5
1E+4
1E+3
1E+2
1E+1
1E+0
300
500
700
900
1100
SHEAR STRESS (Pa)


COMPARISON OF SENSORY PROPERTIES OF SOFT SOLIDS
TABLE I
NUMBER OF PANELLISTS SELECTING PRODUCT
0
2
4
6
8
10
12
14
16
14
6
7
13
DRIER PRODUCT
GREASIER PRODUCT
1% BENTONE 38 SOFT SOLID
NON-BENTONE SOFT SOLID CONTROL

INTERNATIONAL SEARCH REPORT

Intern. al Application No
PCT/EP 96/04318

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A61K7/32

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 501 042 A (COLGATE-PALMOLIVE) 10 September 1982 see claims 1,4,6,7,9,11 see page 7, line 36 - page 8, line 9 see page 10, line 8-17 ---	1-5, 12-14
X	GB 2 018 590 A (THE GILLETTE COMPANY) 24 October 1979 see claims 1,2,5 see page 2, line 65 - page 3, line 6 see example 4 --- -/--	1,2,4,5, 13,14

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

1

Date of the actual completion of the international search	Date of mailing of the international search report
7 February 1997	21.02.97
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+ 31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+ 31-70) 340-3016	Authorized officer Peeters, J

INTERNATIONAL SEARCH REPORT

Inten ial Application No
PCT/EP 96/04318

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 549 223 A (DOW CORNING) 30 June 1993 cited in the application see claim 1 see page 3, line 51 - page 4, line 30 see page 4, line 44-49 see page 5, line 12-21 see claims 3,5	1,2,4-7, 10,12,13
X	EP 0 028 853 A (PROCTER & GAMBLE) 20 May 1981 see claims 1-5 see page 2, line 14-25 see page 7, line 20-29 see page 9, line 21-27	1-5,10, 12,13
P,X	GB 2 299 024 A (UNILEVER) 25 September 1996 cited in the application see claims 1-6 see page 2, line 1-30 see page 5, line 13-14 see page 6, line 7 - page 7, line 11 see page 11, line 1-9	1-5,8-13

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

information on patent family members

Inter al Application No
PCT/EP 96/04318

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		SE-B-	460173	18-09-89
		SE-A-	8201418	10-09-82
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GB-A-2018590	24-10-79	NONE		
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